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Long Run Implications of WTO Accession for Agriculture in China

In recent years, a standard approach to evaluating the welfare effects of trade agreements has been widely used. This approach begins by assessing the applied rate of protection in place before the agreement. It then examines the commitments made under the agreement—commitments such as tariff bindings made under WTO agreements, or commitments made under preferential arrangements. Where these commitments are below the initially applied rates—the most-favored-nation (MFN) tariffs in the case of WTO commitments, or the applied rates under regional arrangements—it is assumed the applied rates will be reduced to respect the commitments. After comparing the bound and applied tariffs at the finest possible level of product disaggregation, the tariffs are aggregated to the level needed for quantitative analysis.

This approach seems a substantial improvement over the simpler approach widely used in earlier evaluations of trade reforms (see, for example, Brandão and Martin, 1993) and still used in studies such as Polaski (2006) where the stylized nature of the tariff reduction is captured in a measure such as a 36 percent cut in applied tariff rates. While policy agreements are sometimes described in simplified terms such as this, the devil is frequently in the details, and the impact on applied tariffs is likely to be quite different from the description when these details are taken into account (see Hathaway and Ingco, 1995). Now that data on applied tariffs and bindings are available on an *ad valorem* basis for standardized commodities at the six-digit level of the Harmonized System, it can take into account a great deal of information that was ignored in earlier studies. This broad approach was used in (Anderson and Martin, 2006), and is now incorporated in the tariff analysis feature of software programs such as WITS (www.wits.worldbank.org).

A key challenge for this type of analysis lies in the counterfactual. What would applied tariffs have been in the absence of the agreement? Here, there are two particularly interesting cases for analysis of agricultural trade reforms. The first is the short-run impact of the tariff reductions on variables such as agricultural output, trade levels and farm incomes. The second is the potential long term implications of these commitments.

The standard approach to specifying the counterfactual level of protection is appropriate for short-run analysis, although there is frequently some ambiguity. Ianchovichina and Martin (2004) for instance, assumed that most of the tariff reductions associated with China's accession to the WTO were actually undertaken before China joined the WTO, as China sought to establish her *bona fides* for the market-oriented WTO system. A similar ambiguity arises in analyses of the Doha negotiations with Europe's pre-announced liberalization of agricultural trade policies. Should such policies be treated as part of the counterfactual, even though they are not locked in through WTO commitments and hence are potentially reversible?

For analyses of longer-run impacts, the specification of the counterfactual is even more challenging. We know that the appropriate counterfactual depends on secular changes in both the level of protection of the type analyzed by Anderson and Hayami (1986) and in the variability of that protection over time (Francois and Martin, 2004). It also depends on the important questions raised in recent research by Melitz (2003) and Kehoe and Ruhl (2003): to what extent would a more liberal regime result in growth of exports and imports at the extensive margin—that is through the emergence of new varieties and new products--as distinct from through increases in the quantities of goods initially traded?

In the case of China's accession to the WTO, it is particularly important to recognize that, prior to accession to WTO, most of the important agricultural trade barriers in China were implemented through measures such as state trading, import and export quotas and licenses (Ianchovichina and Martin, 2004), rather than through trade taxes. Tariff rates for imports of many commodities were high, while the protection actually delivered appears to have been very low or negative for many of these commodities (see Huang, Rozelle, Martin and Liu 2007). Studies such as that by Schmidhuber (2001), which use initial applied tariff rates, tend to overstate the short-run impact of liberalization by overstating the amount of protection actually delivered to domestic producers. In this paper, we draw on new estimates of protection actually delivered to producers and consumers in 2004, as provided by Huang, Rozelle, Martin and Liu (2007).

In the long run, however, there is a risk that our standard approach to welfare evaluation may understate the benefits of reform. In the absence of commitments such as those China made under the WTO, it seems reasonable from the experience of other East Asian economies to assume that farm protection might have risen substantially for political-economy reasons. It also seems likely that this protection would have varied more from year to year, potentially increasing the cost of protection by a substantial margin (Francois and Martin, 2004). Further, the more liberal approach embodied under the WTO is likely to result in an expansion in the range of products traded. Our empirical focus in this paper is on the first of these weaknesses in the standard approach, although we address also the other two in a less formal manner.

To do this, we take advantage of new assessments of levels and trends in agricultural protection in China and other East Asian economies emerging from a new World Bank project on global agricultural distortions (Anderson, 2009). The estimates for the higher-income East Asian countries update and expand on earlier estimates of agricultural protection in the region (Anderson and Hayami, 1986), and estimates for the other 80 countries included in the analysis allow us to put it in a broader context (Anderson and Valenzuela, 2008). New estimates for that project for China (Huang, Rozelle, Martin and Liu 2007) allow us to examine the stance of China‘s agricultural policies back to the early 1980s, when China‘s current generation of farmers first became thoroughly responsive to market prices.

In this paper, we consider first the relationship between national agricultural trade policies and multilateral trade rules. Then, we consider the evolution of agricultural trade distortions in China during the reform era, and place this evolution in the context of the experience of other East Asian economies whose rapid economic growth first occurred when WTO rules on agricultural trade were weak or ineffective. With this as background, we examine what might be the driving forces behind these changes in protection. Then we consider the nature of the commitments on agricultural trade policies associated with China‘s accession to the WTO. Finally, re-examine empirically the long run impact of China‘s accession to the WTO, using the GTAP model of the global economy. In doing so, we consider the implications for China of alternative policy options for dealing with the very real problems of transition associated with China‘s rapid industrialization and

the inevitable relative decline of agriculture that will continue to accompany its rapid economic growth.

1. Agricultural Trade Policy and the GATT

The key principles of the multilateral trading system—nondiscrimination, transparency, the use of tariffs rather than nontariff measures for protection, and disciplines on the level of protection—are just as relevant to agriculture as to other merchandise trade. Unfortunately, however, these principles were severely compromised during the evolution of the multilateral trading system. For farm products nontariff barriers were allowed, tariffs were essentially unrestrained, and even export subsidies were permitted.

A consequence of these developments was a progressive deterioration in international markets for agricultural products, a situation characterized by Johnson (1991) as one of "Agriculture in Disarray". High and rising protection, and the use of domestic and export subsidies, reduced the trend level of international agricultural prices and increased their volatility (Tyers and Anderson, 1992). Much of the protection and market insulation provided by the major industrial countries was wasted—seeking merely to offset the adverse impacts of distortions in other markets on world prices. Further, the pattern of distortions was regressive from the point of view of global farm income distribution. Farmers in rich countries—and especially the larger farmers—were heavily protected while farmers in poor countries were taxed (Krueger, Schiff and Valdes, 1988). It was clear to any dispassionate observer that reform was needed in both rich and poor countries. Given the strong political-economy support for agricultural protection in the industrial countries, it seemed that the only feasible approach to reducing these barriers would be through international negotiations. A negotiated outcome provided at least the hope of finding a better alternative to continuation of the sporadic trade wars that had come to characterize agricultural trade in the absence of multilateral disciplines.

This recognition contributed to the decision of GATT contracting parties to include agriculture in the Uruguay Round negotiations. Despite the well-known difficulties in reaching agreements for this sector, one was reached by 1994 (GATT

1994) that provided a framework for managing international trade in agriculture, including replacement of nontariff barriers by tariff measures and the introduction of disciplines on export subsidies and domestic support. While it had limited success in reducing protection from the levels that it had attained in richer countries (Hathaway and Ingco, 1996), it appears to have contributed to restraining the increases in protection in the industrial countries that had previously seemed to be inexorable (OECD 2006).

Since the Uruguay Round, the procedures for accession to the multilateral trading system appear to have become considerably more rigorous for developing countries (Martin, 2007). This was particularly the case for China, whose accession to WTO was a major event both for China and for the WTO membership, and who undertook reforms that generated substantial benefits both for China and her major trading partners (Bhattasali, Li and Martin, 2004). Some have noted that these reforms involved major changes in agricultural tariffs, but this ignores the fact that most of the protection (and taxation) of China's agriculture prior to accession arose from non-tariff measures such as state trading. Detailed analysis by Huang and Rozelle (2004) takes this into account and shows that the reductions in applied protection to agriculture in China were much smaller than would be implied by the changes in tariffs required by accession.

2. The Evolution of China's Agricultural Distortions

While it is well known that trade and pricing policies in poor countries have tended to tax farmers in poor countries, the evidence on this issue has been much less clear cut for China than for other countries. Some studies examining this issue with price comparisons based on official exchange rates have tended to suggest that farmers in China were protected during the early reform years. However, during the socialist period, a key objective was to accelerate the rate of industrial development, and policy came to finance part of that through direct and indirect transfers from agriculture (Mao Zedong, cited in Lardy, 1983/p. 17).

During the planning era, the prices of agricultural products also appear to have been depressed to allow food to be sold at low prices to urban consumers—a pattern

consistent with that observed in other low income countries (Pinstrup-Andersen, 1988). Guo Shutian's estimates the _scissors difference'—the extent to which the agricultural sector was taxed by the prices of agricultural goods being set below their market values and the prices of industrial goods being set above what would have been their free-market level. That policy involved total taxation of agriculture of an estimated 26 percent in 1957 and 27 percent in 1978, primarily from direct taxation of the prices of agricultural goods (reported in Yao, 1994, p138).

Once adjustments are made for the dual exchange rate regime that prevailed from the early 1980s until unification of the exchange rate in 1994, however, it is possible for a comparison of China' domestic prices with international prices to be used to make inferences about the implications of China's trade and pricing policies for agricultural incentives. Such comparisons are important because agricultural trade was managed using a wide range of nontransparent policies, including state trading, licensing and quotas as well as tariffs. During this period, the household responsibility system was in effect, so price incentives affected not only the real incomes of producers and consumers but also actual production decisions.

Huang, Rozelle, Martin and Liu (2007) provide estimates of protection and taxation for 11 commodities: rice, wheat, maize, soybeans, cotton, pork, milk, poultry, fruit (using apples as a representative product), vegetables (using tomatoes as a representative product) and sugar (both sugarbeet and sugarcane) between 1981 and 2005. Over their study period, these commodities accounted for between 75 percent (in the late 1980s) and 60 percent (during the early 2000s) of the total value of agricultural output in China. A summary of their key results is given in Table 1.

A striking feature of Table 1 is the extent to which producers were directly taxed by agricultural and trade policies in the early reform era. This was particularly the case for staple foods such as rice and maize. Taxation of rice reduced returns to farmers by over 50 percent relative to world price levels. Cotton prices were also strongly depressed, partly because of a desire to have low cost inputs for the processing sector. Returns to other labor-intensive agricultural products such as vegetables and pork were also depressed, partly as a consequence of restrictions on exports. Returns to import-competing agricultural products were much less seriously depressed, and some of these

products, such as sugar and milk, had quite high levels of positive protection. For these products, the goal of self-sufficiency, or at least concerns about vulnerability if grain imports reached double-digit shares of consumption, appear to have resulted in much lower levels of taxation. Protection to agricultural exportables and to maize and cotton remained strongly negative in the late 1980s, while protection to imported commodities became slightly positive.

In the first half of the 1990s, there were very important changes, including the abolition of the system of compulsory procurement of grains. The weighted average rate of taxation fell by half in this period, to just under 20 percent. However, key commodities such as rice, maize and cotton still had negative rates of assistance. In the late 1990s, the taxation of rice diminished greatly, and taxation of a range of other exportable goods disappeared as export restrictions on these goods were removed.[1] Taxation of import-oriented agriculture disappeared completely, to be replaced by significant agricultural protection. In part, this reflected the phase-out of the obligation for farmers to deliver a substantial amount of their output at below-market prices under the production quota system. Incentives for maize protection became positive in this period, with export subsidies applying in at least some years (Huang, Rozelle and Min, 2004). Between 2000 and 2005, direct protection to agriculture became, on average, essentially zero, with protection to both importable and exportable goods reaching low levels.

Annual movements in the protection rates applying to key commodities are given in Figure 1, taken from Huang, Rozelle, Martin and Liu (2007). The NRA_f for rice in Panel A shows the extent of taxation to farm returns for rice. When the obligation to make quota deliveries at below-market prices applied, the depressed procurement prices accounted for a substantial amount of the reduction in farm returns. While these prices were to some degree decoupled from the marginal incentives to producers (Sicular, 1988), they were not fully decoupled in that they did influence the incentives for farm households to stay in agriculture.

The graphs in Figure 1 show the sharpness of the change in policies in the mid-1990s, when the procurement system was abolished and prices were allowed to rise much

[1] Prices for these goods still tended to be below world prices, but this was more a consequence of foreign barriers, than of barriers imposed by China, which were the focus of this study.

closer to world levels. While protection to rice was, on average, still negative, the rates of protection were very low. For wheat, market prices had always been above world prices, but farm prices were, until the abolition of the procurement system, below world prices. Following its abolition, protection rates at the farm level were, on average, slightly positive. For maize, protection rates at the farm level became positive after 1994, despite the fact that maize is generally an exportable. This was partly due to the presence of export subsidies on maize and on cotton, which were ruled out by China‘s WTO commitments.

Another important influence on the incentive environment for China‘s agriculture is protection to the non-agricultural sector. Protection to non-agricultural sectors imposes an implicit tax on the agricultural sector by competing resources away from agriculture. Indeed Krueger, Schiff and Valdés (1988) found this indirect taxation of agriculture to be a greater burden on developing-country agriculture than direct taxation of the type observed above for rice in China. As part of the process of WTO accession, protection rates to both agriculture and manufacturing were reduced substantially, and these reductions were locked-in through tariff bindings. The relative rate of assistance (RRA) depicted in Figure 2 provides a simple summary measure combining the effects of direct and indirect incentives. From the Figure, it is clear that the combined effect of reductions in direct taxation and indirect taxation through protection to other sectors outweighed the effect of reductions in protection to protected agricultural sectors in the late 1990s and early 2000s, and improved the overall incentives for agricultural production in China.

The trends in China‘s agricultural protection have important implications for the estimating the impact of WTO accession. Even though formal tariff rates on many agricultural commodities were high, the rates of applied protection were generally low, as we have seen. Further, WTO commitments generally affected only imported commodities and those subject to prohibited export subsidies.

3. *China's WTO Accession Commitments*

China's WTO accession commitments were extraordinarily comprehensive, covering tariffs, nontariff barriers, services trade reform and a wide range of regulatory aspects of trade, including introduction of an automatic right to trade in goods, as distinct from the positive-list approach that had previously prevailed. An important feature of the agreement was an emphasis on nondiscrimination and transparency. As noted by Kehoe and Ruhl (2003) and by Abbott (2007) the effect of such comprehensive reforms, which create many market opportunities, and create greater confidence in the stability of the trade regime, may well have impacts that go well beyond the effects of the changes in trade barriers. However, estimating the impact of these barriers provides a useful lower-bound initial estimate.

While China's trade regime for non-agricultural commodities included a plethora of nontariff measures, their protective impact appears to have been relatively small by the time of China's accession, at perhaps around 5 percent of the value of trade (Ianchovichina and Martin, 2004). Given the uncertainty about the distribution of this protection across commodities, we focus on the impacts of tariff protection in order to obtain a lower-bound estimate of the impact of accession. The estimates of tariff protection in 1995 used in this analysis are presented in Table 2.

Examination of the estimates of weighted average protection rates for 1995, 2001 and after accession presented in Table 2 suggests that substantial merchandise trade liberalization occurred in China over the period 1995–2001. Weighted average protection dropped substantially for wheat, beverages and tobacco, textiles, apparel, light manufactures, petrochemicals, metals, automobiles, and electronics. Analysis by Huang, Liu, Martin and Rozelle (2004) suggests that some agricultural commodities such as vegetables and fruits, livestock and meat, and rice faced negative protection prior to accession, generally as a result of restrictions on exports. Protection on these commodities rose (or negative protection fell) over the period 1995–2001. Accession did not lead to a significant fall in protection on most agricultural commodities after 2001.

Indeed import protection remained unchanged for most commodities except oilseeds, sugar, and dairy products.

Protection continued to fall for all other merchandise commodities, with especially big cuts for processed food, beverages and tobacco, automobiles, electronics, and other manufactures. A key element of China's accession agreement was the abolition of agricultural export subsidies. This required some significant changes. Huang, Rozelle, and Min (2004) estimate that there was a 32 percent export subsidy on feedgrains and a 10 percent export subsidy on plant-based fibers (particularly cotton) in 2001.

4. China's Agricultural Protection in International Context

As we have seen, there have been substantial changes in China's agricultural distortions since the early 1980s, with most of these changes reducing the disprotection facing farmers. The changes have included reductions in taxation on exported products, reductions in protection to import-competing goods, and reductions in the taxation of farmers imposed through the procurement system. Much of the experience of China has been very specific to the national context of reform and appears very different from the evolution of policy in other East Asian countries. There are, for instance, major differences in the way that key policies have been used. The parallels between China's policies and those of neighboring economies seem limited on issues like the use and abolition of the commune system; the introduction of the household responsibility system; the use and abolition of procurement quotas; and the importance of state trading. Another major difference has been in policies to promote technical change and changes in the composition of exports, which have allowed China to maintain the growth of agricultural output and to avoid dramatic increases in the import volume of key products such as grains.

Despite the differences between China's situation and that of her neighbors, there are also important similarities. As noted by Anderson and Hayami (1986) and by Lindert (1991) the political-economy of trade policy tends to change in similar ways as countries develop. In countries as poor as China was in 1981, urban consumers care a great deal

about the price of food and relatively well organized (Pinstrup-Andersen, 1988). Farmers by contrast, are numerous but poorly organized. They also tend to be subsistence-oriented, selling only a relatively small share of their output in the market. Agricultural products tend to be exports, and hence easily taxed through direct border taxes or, as in the case of China, through state trading enterprises. The result tends to be a policy of taxation of agriculture of the type evident in our earlier discussion of China. Historically, import substitution policies and exchange rate distortions have resulted in protection of the non-agricultural sector, and hence additional, indirect taxation of agriculture.

As economies develop and incomes grow, many of these elements change. Food becomes a smaller share of the expenditure of urban people. As countries become more urbanized, the urban community becomes more diverse in its interests and more difficult to organize. Farmers become more commercial in orientation, selling a larger share of their output in the market, which makes output prices more important to their real incomes. Further, they tend to use more purchased intermediates, which increases the leverage of an output price change on their net income. Finally, the share of the population engaged in farming tends to decline, making farmers easier to organize. Consistent with the theory of collection action (Olson, 1971), commodities where production is concentrated in particular regions or where processing networks lower the cost of communication and organization are more likely to receive high rates of protection.

However, the relationship between incomes and agricultural protection rates is not automatic, and appears to vary somewhat by region. Figure 3 plots the level of agricultural protection against the log of the level of income for a wide range of countries. The tendency for protection rates to increase with rising incomes is strongest in East Asia, particularly Northeast Asia, perhaps partly because the sample contains countries which have achieved relatively high levels of income, and partly because these economies have relatively limited agricultural endowments and hence concerns about self-sufficiency in key food products. What is clear from Figure 3(b) is that, despite China‘s very different political history, its pattern of protection is consistent with that of the other North-East Asian economies, including – like the Republic of Korea and Taiwan (China) – a phase

of negative protection and a rising trend.[2] While the evidence of this pattern in China is only available for 25 years, it is certainly suggestive of a potential common pattern.

To the extent that there are common factors driving the evolution of agricultural protection in the four economies depicted in Figure 3(b), a key difference is the point at which WTO disciplines began to affect agricultural protection levels. In Japan, protection had grown seemingly without limit during its period of high growth, and only towards the end of the sample is there a suggestion of a slowdown in the rate of growth. In Korea, protection rates appear to have begun to plateau in the latter years, possibly under the influence of the relatively mild WTO disciplines to which Korea was subject as a member of the WTO. In China and Taiwan (China), the WTO disciplines negotiated at accession contributed—as discussed above and in Ianchovichina and Martin (2004)—to reducing protection to some degree. But more importantly in view of Figure 3, they have introduced disciplines on future increases in protection in China.

There do not appear to be any respectable efficiency arguments for such protection. One distributional argument is that agricultural protection increases in the early stages of development partly in response to an emerging gap between rural and urban incomes during the course of rural development (Hayami, 2007), but protection is inferior to many policy options that target directly such income differentials. Further, the observed pattern of protection has the undesirable feature of taxing farmers in poor countries, where their incomes are low relative to the rest of the economy, and subsidizing them in rich countries, where the income and wealth levels of farmers are frequently above national average levels (Gardner and Sumner, 2007).

5. Re-assessing the Longer Term Impact of WTO Accession

In the light of Figure 3(b), the question arises as to how valuable WTO accession commitments are in limiting China‘s protection growth. When Japan joined the GATT in 1955, and Korea in 1967, few commitments to limit agricultural protection were made by

[2] Results in Anderson and Hayami (1986) point to a phase of negative protection in Japan at a much earlier stage. For a theoretical analysis as to why it should not be surprising for China‘s polity to follow this path, see Shea 2006).

new members. Japan‘s and Korea‘s average nominal rates of agricultural protection at the time of joining have been estimated recently to be 17 percent and 8 percent, respectively, compared with more than 100 percent today (Hayami and Honma, 2007). China‘s average agricultural protection at the time it joined in late 2001 was even closer to zero (Figure 2). In assessing the impact of WTO accession on China‘s agriculture, to what extent should analysts take into account that binding its tariffs and subsidies at low levels potentially foregoes the losses that would have occurred had there been no such bindings?

To obtain a better idea of the longer-run benefits of WTO accession, what is needed is to project the rates of protection that might have prevailed in the absence of WTO accession into the future (based on the estimates underlying Figure 3), and then to evaluate the effects of lowering this protection to actual post-WTO rates through that time period and discounting those increasing benefits back to the present.

To make an initial assessment of the potential longer-term, advantages of China‘s WTO commitments, we begin by examining a scenario under which China‘s protection rates grow over the period to 2030 in a manner consistent with the international experience. Based on this evidence, we estimate a potential configuration of protection rates in the absence of the WTO agreement. These estimates are presented in Table 3. These estimates tend to be higher in products such as dairy products, where China does not have a comparative advantage, and where farmers are likely to become well organized. They are also quite high on products such as livestock products, in line with the experience of other North East Asian economies, even though China currently has a strong comparative advantage in the more labor-abundant agricultural commodities.

To gain a rough idea of the implications of agricultural trade reform we considered two simple scenarios using the GTAP model of the global economy[3]. In the first of these simulations, we examined the implications of China‘s reforms between 1995—the start of the serious liberalization in preparation for WTO accession—and 2004, when trade policy for agriculture reached a much more liberal stance. From this point, we considered the impact of raising protection to the levels postulated in Table 3. This gives us two very crude estimates of the value of agricultural liberalization—one from an

[3] We double the Armington elasticities to capture the long run nature of changes in protection.

historical benchmark dataset, and another from a counterfactual level of protection based on projected future trends in protection. The results for economic welfare are presented in Table 4.

From Table 4, it appears that the contribution of agricultural trade reform to the overall welfare gain between 1995 and 2004 was relatively small. Agricultural liberalization accounted for under 10 percent of the total gains from the entire package of reforms in agriculture and non-agricultural tariffs. This reflects, in part, the small share of trade in China‘s agriculture, and its relatively small share in output, if not in employment. When we consider the situation from the counterfactual identified in Table 3, the importance of agricultural trade reform increases very substantially. In this situation, close to 20 percent of the gains from trade reform come from reducing agricultural trade distortions.

It is important to recall that the snapshot of protection in Table 3 would likely be part of a secular change in the pattern of protection. If the pattern observed in other countries were to be followed in China, then protection rates could go considerably higher than indicated in Table 3. In this case, the costs of protection are likely to rise even more rapidly, given that the cost of protection rises with the square of the rate of protection. As shown in Table 4, we project that the cost of protection to primary agriculture would increase by a factor of 3.5 with protection rising from its 1995-2004 counterfactual to our projected rates for 2030, while the cost for processed agriculture would rise by a factor of one and a half.

The true costs of protection to agricultural staples are larger than they appear because so much of it is provided in forms that create variations in protection over time. As shown by (Francois and Martin, 2007), changes in the square of the rate of protection, or in the intertemporal variance of protection, have equiproportionate impacts on the cost of protection. If we adjusted the cost of protection to primary agriculture for this factor as well, the increase in the cost from the original estimate would be almost five fold.

Conclusions

In this paper, we have focused on the importance of the counterfactual in assessing the importance of agricultural trade reform. The conventional practice of choosing the initial tariff as the point of departure for assessing the consequences of an agreement appears to be a useful initial rule of thumb. However, there are important reasons to doubt its relevance in the case of China's agricultural commitments.

The recent study by Huang, Rozelle, Martin and Liu (2007) provides information on the trends in protection in China's agriculture, highlighting the fact that most parts of the sector have traditionally been taxed, rather than supported by policy. Related work by Sandri (2007), drawing on the range of international experience in Anderson (2009), has examined some of the key trends in protection. Based on this, we create a projection of protection to agriculture in China in the absence of WTO commitments. Given the relatively low rates of protection prevailing in 1995, we find that the welfare benefits of agricultural reform contributed a relatively small part of the overall welfare gain during this period. If, protection to agriculture should in the absence of WTO commitments would have followed an upward path similar to that in neighboring countries, then the relative importance of agricultural trade reform would likely increase considerably.

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Table 1: Nominal rates of assistance to agricultural industries, China, 1981 to 2005

Crop	1981-84	1985-89	1990-94	1995-99	2000-05
Exportables*	-51.3	-46.4	-21.0	-0.7	-0.2
Rice	-54.2	-34.0	-30.4	-6.6	-7.2
Fruits	-24.6	-9.4	-18.0	0.0	0.0
Vegetables	-37.8	-57.5	-44.6	0.0	0.0
Poultry	27.1	-27.1	-27.6	0.0	0.0
Pork	-75.5	-48.8	-34.4	0.0	0.0
Import-competing*	-22.0	12.1	-5.3	19.5	7.5
Wheat	5.0	22.3	11.3	30.2	4.0
Soybeans	2.8	1.3	4.7	29.5	16.3
Sugar	43.7	44.7	11.7	26.6	29.4
Milk	153.9	58.3	-4.3	18.3	24.8
Mixed trade status*					
Maize	-32.8	-16.1	-25.1	5.3	12.6
Cotton	-30.2	-34.6	-26.2	-3.6	0.7
Weighted average of above products*	-47.4	-41.7	-19.9	-0.1	0.6
Standard deviation[a]	79.5	53.1	24.6	19.5	15.6
Coverage as % of value of total agricultural production (at undistorted prices)	84.6	89.3	88.4	82.2	69.1

* Nominal Rates of Assistance to farmers plus product-specific input subsidies weighted using the value of output at undistorted prices. Mixed trade status products included in exportable or import-competing groups depending upon their trade status in the particular year.

[a] The standard deviation shown is the simple 5-year average of the annual standard deviation around the weighted mean. Source (Huang, Rozelle, Martin and Liu 2007)

Table 2 Estimates of tariff protection in China, 1995 and 2001

(percent)

Product	1995	2001	Post-accession[b]
Agriculture			
Rice	–5.0	–3.3	–3.3
Wheat	25.0	12.0	12.0
Feedgrains	20.0	32.0	32.0
Vegetables and fruits	–10.0	–4.0	–4.0
Oilseeds	30.0	20.0	3.0
Sugar	44.0	40.0	20.0
Plant-based fibers	20.0	17.0	20.0
Livestock and meat	–20.0	–15.0	–15.0
Dairy	30.0	30.0	11.0
Processed food	20.1	26.2	9.9
Beverages and tobacco	137.2	43.2	15.6
Total	4.8	7.6	3.6
Manufacturing			
Extractive industries	3.4	1.0	0.6
Textiles	56.0	21.6	8.9
Apparel	76.1	23.7	14.9
Light manufactures	32.3	12.3	8.4
Petrochemicals	20.2	12.8	7.1
Metals	17.4	8.9	5.7
Automobiles	123.1	28.9	13.8
Electronics	24.4	10.3	2.3
Other manufactures	22.0	12.9	6.6
Total	25.3	13.5	6.9
Total merchandise	24.3	13.3	6.8
Services			
Trade and transport	1.9	1.9	0.9
Construction	13.7	13.7	6.8
Communications	9.2	9.2	4.6
Commercial services	29.4	29.4	14.7
Other services	24.5	24.5	12.7
Total	10.3	10.3	5.2

Source: Ianchovichina and Martin (2004)

Table 3. Potential protection rate scenario in the absence of WTO commitments

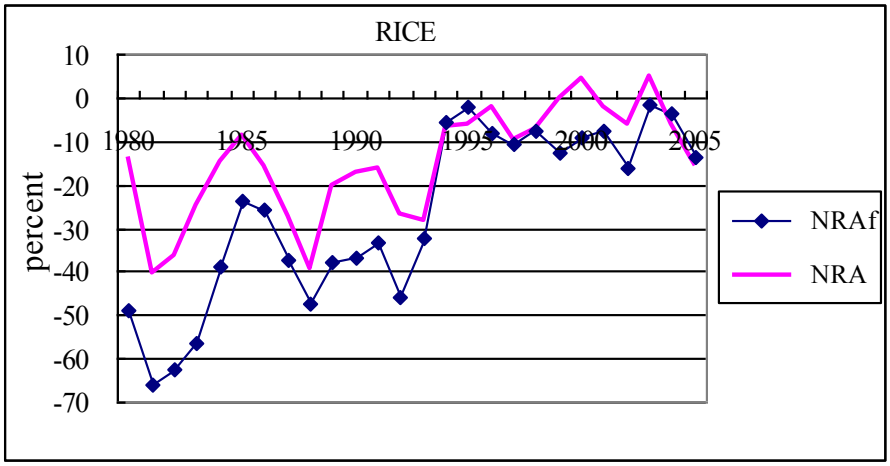
	CHINA NRAs 2030
	%
Paddy rice	100
Processed rice	100
Wheat	80
Cereals	80
Fruits & vegetables	50
Oilseeds	10
Oils & fats	10
Sugar raw	150
Sugar processed	150
Plant-based fibers	40
Crops nec	65
Livestock	150
Meat products	150
Other animal products	20
Other meat products	20
Wool & silk-worm	40
Milk raw	200
Dairy	200

Table 4. Estimated impacts of reforms from different levels of agricultural protection (welfare measure in 2004 US levels)

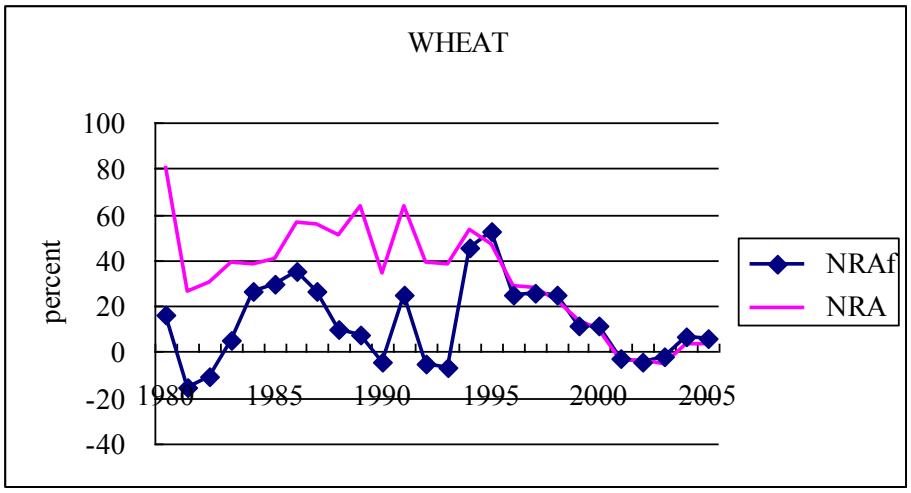
	1995-2004	Counterfactual
	$m	$m
Primary Agriculture	385	1330
Processed Agriculture	1589	2276
National Total	20053	20125

Figure 1. Nominal rates of assistance to rice, wheat and maize, China, 1981 to 2005
(percent)

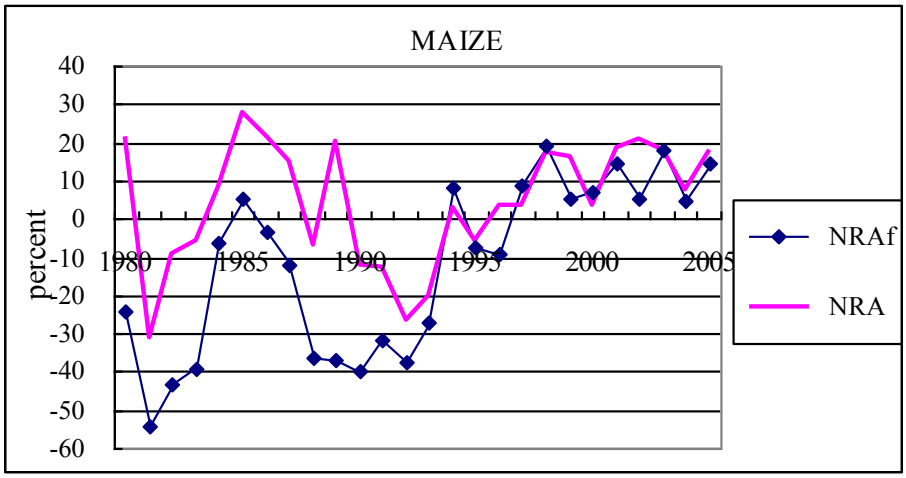
Panel A. Rice



Panel B. Wheat

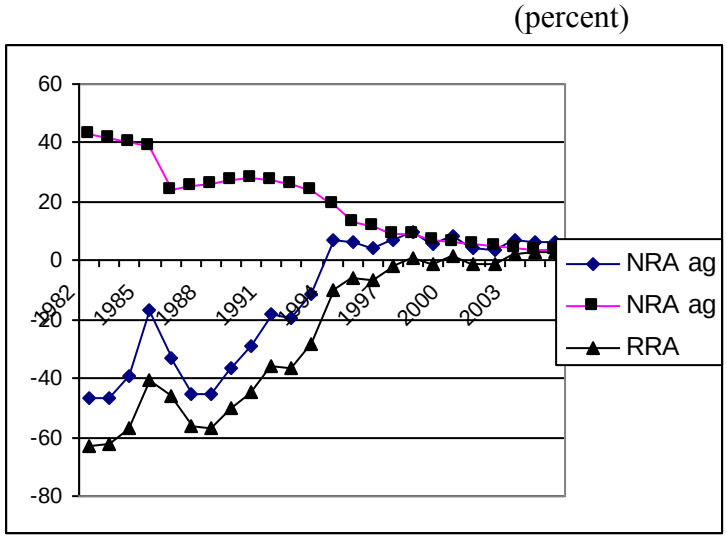


Panel C. Protection to maize, conditional on trade status, %



Source: Huang, Rozelle, Martin and Liu (2007)

Figure 2. Nominal rates of assistance to agricultural and non-agricultural tradables, and relative rate of assistance,[a] China, 1981 to 2005

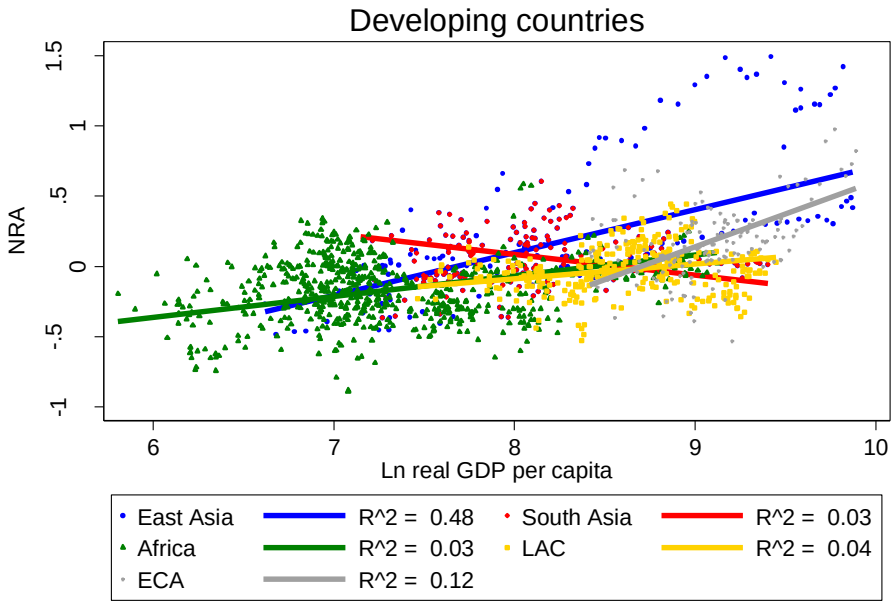


[a] The relative rate of assistance is calculated as RRA = 100[(100+NRAag)/(100+NRAnonag) - 1], where NRAag and NRAnonag are the nominal rates of assistance to agricultural and non-agricultural tradables, respectively

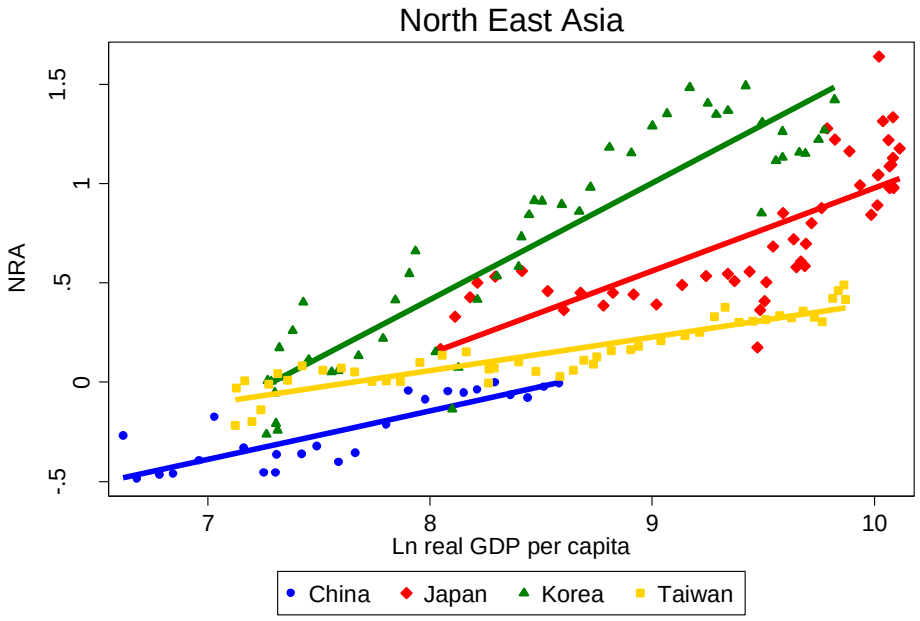
Source: Huang, Rozelle, Martin and Liu (2007)

Figure 3. Nominal rate of assistance to agriculture (NRA) and real GDP per capita

(a) all developing countries



(b) East Asian economies



Source: Anderson (2009)